

RANDOM NOTES ON AMERICAN POTAMIDIDAE

BY J. BEQUAERT

Museum of Comparative Zoölogy, Cambridge, Massachusetts

While preparing a revision of the Western Atlantic Potamididae for "Johnsonia" some matters of synonymy and nomenclature had to be considered which could not properly be discussed there. Yet the conclusions reached seem sufficiently interesting to warrant publication.

1. The genotype of *Cerithidea* Swainson, 1840, Treatise of Malacology, pp. 198, 203 and 342. On p. 342, Swainson mentioned two species: *C. lineolata* Griff. Cuv. 14. f. 4; and *C. fragilis*. Ib. 32. f. 12. One of these must be the genotype. So far as I can trace, the first valid type designation is by Pilsbry and Harbison (1933, Proc. Acad. Nat. Sci. Phila., 85, p. 115), who state that a new species of *Cerithidea* they describe has a character "not possessed by the genotype, *C. obtusa* (Lam.)." Swainson's first species, *Melania lineolata* Griffith and Pidgeon (1834, Cuvier's Animal Kingdom, 12, Pl. 14 of Moll., fig. 4) is, from the excellent figure, unquestionably identical with *Cerithium obtusum* Lamarck (1822, Hist. Nat. An. sans Vert., 7, p. 71). This *M. lineolata* was renamed *Cerithium truncatum* by Griffith and Pidgeon in their Index (pp. 596 and 598), because of the earlier *Melania lineolata* (Gray) (*Strombus lineolatus* Gray, 1828), shown on Pl. 13, fig. 4 of the same work.

J. E. Gray in 1847 (Proc. Zool. Soc. London, p. 154) gave as first choice for the type of *Cerithidea*, *Murex decollatus* Linnaeus (1767), and as second choice, *Strombiformis costatus* da Costa (1778); but neither of these species was originally included by Swainson. For a similar reason, Kobelt's designation of "*Cer. decollatum* L." (1888, Syst. Conch. Cab., 1, Abt. 26, p. 4) is also invalid. Wenz (1940, Handbuch d. Paläozool., Gastropoda, Bd. 6, pt. 6, p. 742) cites as type, on the authority of Makiyama, "*C. lineolata* Griffith and Pidgeon [*Melania*] = *decollata* (Linné) [*Murex*]." This is erroneous on two scores. First, Griffith and Pidgeon's *Melania lineolata* (of Pl. 14, fig. 4) is not the East African *Cerithidea decollata*, but the Indo-Malayan *C. obtusa*. Secondly, Makiyama (1936, Mem. Coll. Sci. Kyoto Imp. Univ.,

ser. B, 11, No. 4, p. 221) selected *Melania lineolata* Griffith and Pidgeon, 1834, as type; but he did not decide what it was, merely noting that it seemed "not very different from *Cerithidea decolata* (Linné, 1767)."

Swainson's second species, *Cerithium fragile* Deshayes (1833), is a fossil shell of the genus *Potamides*.

2. I recognize only three species of *Cerithidea* now living in the Western Atlantic: *C. costata* (da Costa, 1778), *C. pliculosa* (Menke, 1829), and *C. scalariformis* (Say, 1825).

Cerithidea insulacmaris Pilsbry and Harbison (1933) is known only from the Miocene of New Jersey. I am unable to understand why Wenz (1940, *op. cit.*, p. 742) cites it as from the Miocene to ? Recent; and quotes it as "Rezent" under the figure which he copied from the original. Moreover, it was taken from a well, not near the locality "Well." No Potamididae have been found alive on the Atlantic coast of America north of South Carolina.

3. The following names I regard as synonyms of *Cerithidea costata* (da Costa), in its typical form, that is with smooth or almost smooth longitudinal ribs: *Strombiformis costatus* da Costa (1778); *Cerithium lafondii* Michaud (1829); *Cerithium ambiguum* C. B. Adams (1845) (cotypes of Adams' species have smooth ribs and his description does not mention that they are nodulose); *Cerithium salmacidum* Morelet (1849) (cotypes seen); *Cerithium petitii* Schramm (1869) (*nomen nudum*; validated by Tryon, 1887, as a synonym of *C. costata*); and *Cerithidea pupoidea* Mörch (1876).

Cerithidea costata turrata Stearns. *Cerithidea turrata* Stearns (1872), is at most a race of *C. costata*, peculiar to the west coast of Florida. It is on the average smaller and more slender than typical *costata*.

Cerithidea costata beattyi J. Bequaert (1942) was proposed for the form of *C. costata* with more or less nodulose ribs figured by Reeve (1866) as *C. ambigua* (not *Cerithium ambiguum* C. B. Adams, 1845). The type locality is St. Croix, Virgin Islands; but it is also known from the Bahamas, Barbuda and Trinidad.

4. *Cerithidea minor* Mörch (1876, *Malak. Blätt.*, 23, p. 92; Cuba) is the only published name, based on a Western Atlantic

potamidid, which I am unable to recognize. The description fits a variant of *C. costata*; but the measurements are unlike any adult I have ever seen of that species: "Long. $1\frac{1}{4}$ mm.; lat. $2\frac{1}{2}$ mm." From the unusual disproportion between length and width, I suspect that the length given is a misprint. Perhaps the type is still in existence and may settle the matter.

5. *Cerithidea pliculosa* (Menke) is the earliest valid name for the species usually called *C. iostoma*. Möreh (1876) saw the type of *Cerithium pliculosum* Menke (1829) at the Copenhagen Museum and he included it among his West Indian varicose *Cerithidea* ("T varicigera, labro incrassato"), all of which I regard as one and the same species. The following names I regard as synonyms of *Cerithidea pliculosa*: *Potamides iostomus* Pfeiffer (1839) and *Cerithium lavalleanum* d'Orbigny (1842). On the other hand, *Cerithium varicosum* Valenciennes (1832), *Cerithium varicosum* Sowerby (1834), *Cerithidea aguayoi* Clench (1934), *Cerithium fortiusculum* Bayle (1880), *Cerithium hanleyi* Sowerby (1855), *Cerithium lafondii* Michaud (1829), and *Cerithium hegewischii* Philippi (1848) were based on different species. *C. lafondii* I synonymize with *Cerithidea costata*, after a careful study of Michaud's original figure, as well as that by Kiener (1841-42). The remaining names do not refer to Western Atlantic shells (see below).

C. pliculosa veraacruzensis J. Bequaert (1942) was proposed for the Mexican and Central American form in which the spiral ridges are at least as pronounced as the vertical ribs, producing a cancellate surface. The type locality is Vera Cruz, Mexico. I have also seen it from British Honduras, Guatemala and Nicaragua.

6. The following names are synonyms of *Cerithidea scalariformis* (Say): *Pirena scalariformis* Say (1825), *Potamides tenuis* Pfeiffer (1839), and *Cerithidea hanleyana* Reeve (1866).

7. All *Batillaria* of the Western Atlantic belong to one species, *Batillaria minima* (Gmelin), the following published names referring to individual variants in color or sculpture of the typical form: *Murex minimus* Gmelin (1790), *Cerithium clathratum* "Menke" (1828, *nomen nudum*) Möreh (1876), *Cerithium nigrescens* Menke (1828), *Cerithium septemstriatum* Say (1832),

Cerithium heteroclytes Potiez and Michaud (1838) (not of Lamarck, 1822), *Cerithium peloritatum* Kiener (1841-1842) (not of Cantraine, 1835), *Cerithium eriense* "Valenciennes" Kiener (1841-1842),¹ *Cerithium albovittatum* C. B. Adams (1850), and *Cerithium albocoopertum* C. A. Davis (1904). Some colonies are only of one type, but others are a mixture of several variants, with all transitions. None of these variants are geographically or ecologically segregated; hence they do not, in my opinion, deserve to be recognized in nomenclature.

Only two forms of *B. minima* appear sufficiently distinct to warrant varietal or subspecific names: *Batillaria minima rawsoni*, described as *Cerithium rawsoni* "Krebs" Möreh (1876), is definitely known from Bermuda and the Bahamas. *Batillaria minima degenerata*, described as *Cerithium (Pyrazus) septemstriatum* var. *degeneratum* Dall (1894), occurs in the Bahamas and Hispaniola.

The following names are not synonyms of *B. minima*: *Trochus striatellus* Dillwyn (1817), *Cerithium peloritatum* Cantraine (1835), *Cerithium laevigatum* Philippi (1844), *Cerithium nigrinum* Philippi (1848), *Cerithium desolatum* Bayle (1880), and *Cerithium heteroclytes* Lamarck (1822). (See below.)

Cerithium brongniartii Maravigna (1840), *C. hymerense* Calcara (1840) and *C. pirayni* Benoit (1843), sometimes referred to *B. minima*, are Mediterranean shells, not related to that species and not further considered here.

8. *Cerithium (Potamides) hegewischii* Philippi (1848, *Zeitsehr. f. Malak.*, 5, p. 19; 1849, *Abb. Beschr. Conch.*, 3, pt. 4, p. 15, Pl. 1 of *Cerithium*, fig. 6) was described merely from "Mexico." Möreh (1876) thought he recognized it in a shell from Texas, evidently of what I call *Cerithidea pliculosa* (Menke) (= *iostoma* Pfeiffer). Tryon (1885, *Man. of Conchol.*, Ser. 1, 9, p. 161; name misspelled *hegewischii*) regarded it as a synonym of the Pacific *C. montagnei* var. *pulchra* C. B. Adams (1852); while v. Martens (1900, *Biol. Centr. Amer.*, Terr. Fluv. Moll., p. 570) treated it as a variety of the Pacific *Potamides (Cerithidea) varicosus*

¹ The supposed occurrence of this snail in Lake Erie was no doubt due to a badly written label. Possibly it bore the name of the collector (?Eyries) or the old Indian name of the Island of Trinidad ("Iere").

(Kiener), which he separated specifically from *montagnei* d'Orbigny (1841). I am inclined to accept v. Martens' view. The large *Cerithidea* of the Pacific coast, from southern California to Ecuador, are readily separable into two species, a conclusion reached long ago by Carpenter (1856). These two species bear somewhat the same relationship to each other as the Atlantic *C. pliculosa* and *C. scalariformis*.

Cerithidea montagnei (d'Orbigny), described as *Cerithium montagnei* d'Orbigny (1841, Voy. Amér. Mérid., 5, Moll., p. 443, Pl. 63, figs. 3-4; Guayaquil River, Ecuador), has strong vertical ribs, weak or no spiral ridges above the periphery, and usually no varices; sometimes there is one fine, rib-like varix on the penultimate or antepenultimate whorl; the mouth is subcircular, with the outer lip well spread out and ascending on the body-whorl; the columella is short, very thick in the adult, and has a fold on the back. Carpenter (1857, Cat. Mazatlan Shells, p. 342) recognized it correctly. He also pointed out that *Cerithium reevianum* C. B. Adams (1852, Ann. Lyc. Nat. Hist. New York, 5, p. 380; 2½ mi. E. of Panama) is the same; but that *Cerithium largiliierti* Philippi (1848) is a different species, from the Far East. I have seen *C. montagnei* from Mexico (Mazatlan), San Salvador (Gulf of Fonseca), Nicaragua (Corinto) and Panama (Bella Vista; Punta Paitilla).

Cerithidea hegewischii (Philippi) has, in addition to the vertical ribs, strong spiral ridges producing tubercles where they cut the ribs; there are several (5 to 7) very thick varices, spaced along the spire; the mouth is rounded-subquadrate, with the outer lip thickened but not expanded and not ascending on the body-whorl; the columella is little or not thickened and bears no fold on the back. Philippi gave the length of his type as 15 lines (= 32.7 mm.). I am unable to separate, even as a variety, *Cerithidea* ? *varicosa* var. *mazatlanica* Carpenter (1856, Cat. Mazatlan shells, p. 344; Mazatlan, Mexico), after examining cotypes at the Mus. Comp. Zoöl. It averages 24 mm. in length, exceptionally reaching 33 mm. Reeve (1866, Conch. Icon., 15, *Cerithidea*, Pl. 1, fig. 8) figured one of the rare specimens with only one varix well developed. I have seen typical *C. hegewischii* from Mazatlan and the coast of Sonora (Guaymas; 10 mi. N. of Guaymas;

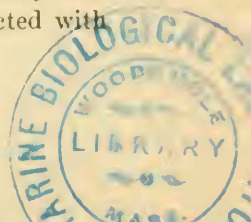
Punta Peñaseo; Kino Bay). Some of these specimens are transitional to var. *albonodosa*, to which Carpenter referred specimens from Guaymas (1864, Rept. Brit. Assoc. Adv. Sci. for 1863, p. 667).

In the northern part of its range *C. hegewischii* is more slender, with the varices lower, though conspicuously dirty white. This is *Cerithidea albonodosa* Carpenter, 1857, Proc. Zool. Soc. London for 1856, p. 205 (San Diego, California), which he later stated was probably a variety of his *mazatlanica*. Reeve (1866, Conch. Icon., 15, *Cerithidea*, Pl. 1, figs. 1a-b) figured it correctly. I have seen *C. hegewischii* var. *albonodosa* from California (San Diego) and Lower California (Magdalena Bay; Espiritu Santo Id.).

South of Mexico *C. hegewischii* grows much larger, with coarser sculpture, producing the var. *pulchra* (C. B. Adams), which, however, intergrades with the typical form. I have seen it from Nicaragua (Corinto), Costa Rica (Gulf of Nicoya) and Panama (Panama City; Punta Paitilla; Bella Vista; Empire, C. Z.). The following names appear to be synonyms of *pulchra*, being either preoccupied or of later date: *Cerithium varicosum* Valenciennes (1832), *Cerithium varicosum* Sowerby (1834), *Serithium validum* C. B. Adams (1852), *Cerithidea solida* "Gould" Carpenter (1857), *Cerithium fortiusculum* Bayle (1880), *Potamides meta* Li (1930), and *Cerithidea aguayoi* Clench (1934).

Cerithium pulchrum C. B. Adams, 1852, Ann. Lye. Nat. Hist. New York, 5, p. 380 (2½ mi. E. of Panama) [1852, Panama Shells, p. 156]. According to the description this could only be the large form of *C. hegewischii*, since it has "very stout varices 240° distant." It was correctly figured by Reeve (1866, Conch. Icon., 15, *Cerithidea*, Pl. 4, fig. 29) and Kobelt (1890, Syst. Conch. Cab., 1, Abt. 26, Pl. 11, figs. 7-8). E. v. Martens' *C. montagnei* var. *pulchra* (1900, *op. cit.*, p. 570) was, however, the variant of *C. montagnei* with a single, thin, rib-like varix.

Cerithium varicosum Valenciennes, 1832, in Humboldt and Bonpland, Observ. Zool. Anat. Comp., 2, p. 282 (supposedly from Cumana, Venezuela). This is readily recognized as the large form of *C. hegewischii* of the Pacific. The type locality was erroneous, as shown by the statement that it was collected with



C. humboldtii and *C. lamarckii*, both forms of the species of *Rhinocoryne* peculiar to the Pacific coast of Central America. The specific name is preoccupied by *Cerithium varicosum* (Brocchi) Defrance, 1817.

Cerithium varicosum Sowerby, 1834, Genera of Shells, No. 42, Pl. 213, fig. 5 (with brief description in letterpress; no locality); 1855, Thesaurus Conchyl., 2, p. 887, Pl. 186, figs. 280-282 (Real Llejós or Realejo, on the Pacific coast of Nicaragua). This is clearly the same as *C. varicosum* Valenciennes, although it is described as a new species.

Cerithium validum C. B. Adams, 1852, Ann. Lye. Nat. Hist. New York, 5, p. 381 (2½ mi. E. of Panama) [1852, Panama Shells, p. 157]. This was taken together with *C. pulchrum* and appears to be based on large and slender specimens of the latter, reaching 1.6 inch (40.6 mm.) in length, while *pulchrum* is said to be 1.25 inch (33.7 mm.) long. It is what Reeve figured as *C. varicosa* from Real Llejós (1866, Conch. Icon., 15, *Cerithidea*, Pl. 3, fig. 19a; his fig. 19b, presumably based on a specimen from Jamaica, is *C. pliculosa* Menke).

Cerithidea solida "Gould" P. P. Carpenter 1857, Rept. 26th Meet. Brit. Assoc. Adv. Sci. for 1856, p. 230 (without description; as a synonym of *valida* C. B. Ads. and *varicosa* Sow.; Panama).

Cerithium fortiusculum Bayle, 1880, Jl. de Conchyl., 28, p. 250, was a new name proposed for *Cerithium varicosum* Sowerby (1834).

Potamides meta Li, 1930, Bull. Geol. Soc. China, 9, p. 267, Pl. 6, fig. 50 (Bay of Panama; "probably recent"). As shown by Pilsbry (1931, Proc. Acad. Nat. Sci. Phila., 83, p. 433), this was based, not on a fossil, but on a worn example of *Cerithidea hege-wischii* var. *pulchra* (C. B. Adams) (= *valida* C. B. Adams).

Cerithidea aguayoi Clench, 1934, Proc. Boston Soc. Nat. Hist., 40, pt. 1, p. 110 (new name for *Cerithium varicosum* Sowerby, 1834; not of Defrance, 1817; a new name was proposed by Bayle in 1880). This was included by error in the list of marine mollusks of the Atlantic coast of the United States, Sowerby's species being from the Pacific coast of Central America, as shown above. The error started with Mörch (1876, Malak. Blätt., 23, p. 88), who believed *Potamides iostoma* Pfeiffer to be Sowerby's *C. vari-*

cosum. Dall also mentioned *C. varicosa* as occurring in Texas (1889, Bull. U. S. Nat. Mus., No. 37, p. 140), these specimens being *C. pliculosa* (Menke) (= *iostoma* Pfeiffer), a species which he does not list.

9. The earliest valid name for the most common Californian Potamidid is *Cerithidea californica* (Haldeman), described as *Cerithium (Potamis) californicum* Haldeman, 1840, Monogr. Limn. Fresh-water Univ. N. America, No. 1, unnumbered back page of cover (California; with description). I have seen many lots, the species being known from Bolinas Bay to San Diego and in Lower California to Todos Santos Bay. I am not fully convinced that it is more than a race of *C. hegewischii*. Carpenter also seemed to believe that it intergrades with his *mazatlanica* (= *hegewischii*) (1864, Rept. Brit. Assoc. Adv. Sci. for 1863, p. 655). The following names are synonyms of *C. californica*: *Cerithium sacratum* Gould (1849), *Potamis pullatus* Gould (1855), *Cerithidea fuscata* Gould (1857), and *Pirena californica* "Nuttall" Carpenter (1857).

Cerithium (Potamis) sacratum Gould, 1849, Proc. Boston Soc. Nat. Hist., 3, p. 118 (Sacramento River, California); 1852, U. S. Explor. Exped. Wilkes, 12, Moll., p. 144, Pl. 10, figs. 166-166a. The northern Californian specimens of *C. californica* are often more weakly costate than those from farther south; but there are many transitions. It is possible, moreover, that Haldeman's types came from near San Francisco.

Potamis pullatus Gould, 1855, Explor. Surv. R. R. Mississippi to Pacific, App. to Prelim. Geol. Rept., p. 25 (San Diego, California); 1856, Repts. Explor. Surv. R. R. Mississippi to Pacific, 5, pt. 2, p. 333, Pl. 11, figs. 23-24. This was based on typical, strongly costulate *C. californica*.

Cerithidea fuscata [*Potamis fuscata*] Gould, 1857, Proc. Zool. Soc. London for 1856, p. 206 (San Diego, California). Based on typical, strongly costulate *C. californica*.

Pirena californica "Nuttall MS" was cited by Carpenter (1857, Proc. Zool. Soc. London for 1856, p. 206) as a synonym of *C. fuscata* Gould.

Cerithidea californica var. *hyporhyssa* (Berry). Described as *Cerithidea sacrata* var. *hyporhyssa* Berry, 1906, Nautilus, 19,

p. 133, fig. (San Diego, California), this is no more than an ecological form, characterized by the smooth or nearly smooth, flat whorls. It intergrades with typical *californica* in the type locality.

10. *Cerithium hanleyi* Sowerby, 1855, Thesaurus Conchyl., 2, p. 874, Pl. 183, fig. 193 (no locality). This is a true *Cerithium*, by the deep, oblique basal channel, and the sinus in the upper angle of the mouth. It seems to be identical with *Cerithium rubro-lineatum* Sowerby (1855, *op. cit.*, 2, p. 874, Pl. 183, fig. 199), as Tryon recognized. *Cerithidea hanleyana* Reeve, 1866, is a true *Cerithidea* (*C. scalariformis* Say), but it is not Sowerby's *C. hanleyi*.

11. *Cerithium heteroclytes* Lamarck, 1822, Hist. Nat. An. sans Vert., 7, p. 74 ("mers de la Nouvelle-Hollande"). The size (15 $\frac{3}{4}$ French lines = 35.5 mm.) alone makes the reference to *Batillaria minima* impossible, the largest specimen seen of the latter being only 21.5 mm. long (usual size, 12 to 18 mm.). Lamarck states that the specimen was given to him by Macleay, hence there is no reason to doubt his locality. His shell was most probably a deformed specimen of *Batillaria australis* (Quoy and Gaimard, 1834), and I have seen one from Tasmania which fits the description. If this synonymy is correct, the Australian species will have to be called *Batillaria heteroclytes* (Lamarck). On the other hand, *Cerithium heteroclytes* Potiez and Michaud, 1838, Gal. Moll. Douai, 1, p. 365, Pl. 31, figs. 21-22 (without locality), was not Lamarck's species, but a deformed *Batillaria minima*. The figure, supposedly natural size (according to Expl. of Plates, p. 49), is only 18.3 mm. long.

12. The following names appear to be based on the Mediterranean *Pirynella conica* (Blainville, 1829) :

Cerithium peloritanum Cantraine, 1835, Bull. Acad. Bruxelles, 2, p. 392 (near the lighthouse at Messina, Sicily). The erroneous listing of this name as a synonym of *Batillaria minima* was due to the fact that Kiener's (figured) *C. peloritanum* (1841-1842), from "the coasts of Florida," was the North American species.

Cerithium laevigatum Philippi, 1844, Enum. Moll. Siciliae, 2, p. 161, Pl. 25, fig. 32 (Sea of Sicily) (not of Eichwald, 1830). Apparently based on a worn *P. conica*; certainly not *Batillaria minima*.

Cerithium desolatum Bayle, 1880, Jl. de Conchyl., 28, p. 247, is a new name for *Cerithium laevigatum* Philippi (1844); hence also a probable synonym of *P. conica*.

13. *Cerithium nigrinum* Philippi, 1848, Zeitschr. f. Malak., 5, p. 24 (no locality); 1849, Abb. Besch. Conch., 3, pt. 4, p. 20, Pl. 1 of *Cerithium*, fig. 19. This is a synonym of *Cerithium variabile* C. B. Adams, 1845 (*Cerithium ferrugineum* Say, 1832; not of Bruguière, 1792). The characters which Philippi uses to differentiate his *nigrinum* from Say's *septemstriatum* are precisely those that separate *C. variabile* from *Batillaria minima*.

14. *Trochus striatellus* Dillwyn, 1817, Deser. Cat. Rec. Shells, 2, p. 213, is merely *Trochus striatellus* Linnaeus, 1758, Syst. Nat., 10th Ed., 1, p. 760, from the Mediterranean, the only definite synonym cited by Dillwyn. He adds, as doubtful synonyms only: *Cerithium zonale* Bruguière, *Murex minimus* Gmelin and Lister's fig. 81, Pl. 1018 of the Hist. Conchyl. The species is unrecognized, but there is no reason to believe that it could have been *Batillaria minima*. Hanley (1855, Ipsa Linnaei Conchylia, p. 325) says it was not in Linnaeus' own collection. He regards Bruguière's doubtful synonymy with *Cerithium zonale* as disagreeing with part of the original description.

15. The earliest correct name for the only known species of *Rhinocoryne* v. Martens (1900), of the eastern Pacific, is *R. humboldti* (Valenciennes). This was described as *Cerithium humboldti* Valenciennes, 1832, in Humboldt and Bonpland, Observ. Zool. Anat. Comp., 2, p. 280 (supposedly from Cumana) and is readily recognized. The type, was, however, not found at Cumana, Venezuela, but somewhere on the Pacific coast of South or Central America. Kiener (1841-1842, Spec. Gén. Icon. Coq. Viv., 6, *Cerithium*, p. 83, Pl. 26, fig. 2) apparently figures the type.²

Cerithium lamarckii Valenciennes, 1832, *op. cit.*, 2, p. 281 (from the same locality as *C. humboldti*), is the rare individual variant of *R. humboldti* with two peripheral rows of spinose tubercles, instead of one. At the Museum of Comp. Zoöl., one such speci-

² In the copy at Mus. Comp. Zoöl., the section of Kiener's work covering the "Famille des Canalifères" is bound as vol. 6. In other copies, this forms vol. 4.

men was found among some 50 normal ones, all from Panama. It might be called *R. humboldti* var. *lamarckii*, but is scarcely worth naming. Kiener presumably figured the type (1841-1842, *op. cit.*, p. 84, Pl. 27, fig. 3).

Cerithium pacificum Sowerby, 1834, Genera of Shells, No. 42, Pl. 213, fig. 9 (without locality or description). This is a synonym of the earlier *Rhinocoryne humboldti* (Valenciennes), as Kiener pointed out a century ago. It was based on the typical form, with one row of spines.

16. It has been claimed that both *Cerithidea costata* (da Costa) and *Batillaria minima* (Gmelin) live not only in the Western Atlantic, but also in the Mediterranean, on the coast of Sicily. Aradas and Benoit (1870, *Conehigliologia Viv. Marina Sieilia*, pp. 231-233) report the first as "*Cerithium costatum*," and the second as "*Cerithium erienne*," and believe that both were introduced alive from the Antilles, attached to the bottom of ships. Having seen no Sicilian specimens, I am unable to dispute the identifications. If these were correct, it is more probable that the shells were imported in ship's ballast. That they now occur alive and are acclimatized in Sicily needs confirmation.

THE HABITS OF LIFE OF SOME WEST COAST BIVALVES

BY DR. FRITZ HAAS

Chicago, Ill.

(Concluded from page 113)

3. *On Some Members of the Mytilus californianus Association.* The California mussel certainly is one of the commonest, if not the commonest bivalve of the West Coast. Thanks to a comparatively heavy shell and to strong byssus threads, the species is enabled to maintain itself even in habitats which, because of the heavy surf which beats them, would be uninhabitable for other mollusks. Wharfpiles and cliffs which otherwise would be almost destitute of an epifauna, may have a pad of mussels packed side by side and mostly covering the substratum to invisibility. Other organisms which are not so perfectly protected against the surf action, invariably settle on and between the California mussels